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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/597,797

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EXAMINER

LE, QUANG V

ART UNIT

PAPER NUMBER

2622

NOTIFICATION DATE

DELIVERY MODE

08/04/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/597,797	Applicant(s) SASAKI ET AL.	
	Examiner QUANG V. LE	Art Unit 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 11-13 and 17-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 11-13 and 17-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in response to the election of species requirement for application 10/597797 filed on 6/15/2009.
2. **Claims 1-8, 11-13 and 17-20** have been examined and are pending.

Information Disclosure Statement

3. An initialed and dated copy of Applicant's IDS form 1449 is attached to the instant office action.

Priority

4. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Response to Restriction/Election

5. Applicant's election with traverse of Species I, illustrated in figure 4 which claims **1-8, 11-13 and 17-20** are readable in the reply filed on 6/15/2009 is acknowledged.

The traversal is on the ground(s) that the examiner has failed to specifically describing the unique special features in each group/species.

In response to this argument, the examiner wants to point out that figure 4 and figure 16 represent two different and distinct inventive concepts. Figure 4 illustrates an image pick up device with a compensation unit 10 between the A/D converter 15 and

Art Unit: 2622

the Signal Processing Unit 16. Figure 16 illustrates the Signal Processing Unit 16 is between the A/D converter 15 and the Compensation Unit 48. Figure 4 illustrates two driving signal to the Horizontal and Vertical driving units 13 and 14 in which figure 16 does not have the same signals, instead it has a memory unit 47. There may very likely be an overlap which already means that the examiner must look at two things at the same time, or repeat the search, which is already a burden either way. In addition to that, separate inventions each must be exhaustively searched beyond that single designation, which already poses a serious time constraint in searching for separate inventions, which then requires formulating separate disparate rejections or actions otherwise.

Claims 9-10 and 14-16 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected fig 16

The requirement is still deemed proper and is therefore made FINAL.

Specification

6. The abstract of the disclosure is objected to, because it contains references such as (12), (17). These references cause confusion to the readers. Correction is required. See MPEP § 608.01(b).

Claim Objections

7. Claim 1 is objected to because of the following informalities:

Art Unit: 2622

As per claim 1 – in line 11 “ sensor,;” should be changed to “ sensor,;”

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-7, 11-13 and 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Hayashi Yoshiharu, JP 2001-358999.

As per claim 1 (Original), an imaging device has the following limitations taught by Yoshiharu:

A MOS image sensor including a light receiving surface made up of a plurality of pixel units arrayed in a plurality of lines (paragraph 0001-0016);

A detection unit operable to detect a horizontal shift amount in images corresponding to two or more lines from among images on the respective lines read out for each horizontal cycle from said MOS image sensor (paragraph 0017). *The 2nd direction is the horizontal direction in the claim.*

A determination unit operable to determine a head position to be a head pixel in at least one line out of the plurality of lines, based on the horizontal shift amount

Art Unit: 2622

(paragraphs 0018-0019). *The "starting position of a pixel" is the head position to be a head pixel as cited in the claim.*

A horizontal compensation unit operable to generate a compensation image based on the determined head position (paragraph 0021). *The blurring correction is the compensation unit as cited in the claim.*

As per claim 2 (Original), Yoshiharu teaches the imaging device according to claim 1 Yoshiharu further teaches wherein said detection unit is operable to detect the horizontal shift amount of the images corresponding to all adjacent two lines in the plurality of lines (paragraphs 0030-0032).

As per claim 3 (Original), Yoshiharu teaches the imaging device according to claim 1, Yoshiharu further teaches wherein said determination unit is operable to determine the head position at least one of the two or more lines, based on the horizontal shift amount (paragraphs 0018-0019)

As per claim 4 (Original), Yoshiharu teaches the imaging device according to claim 2 Yoshiharu further teaches wherein said determination unit is operable to determine the head position of the line read out subsequently, between the adjacent two lines of all adjacent two lines, based on the horizontal shift amount (paragraph 0021). *Yoshiharu teaches "scanning section that chooses the line concerned in the 1st*

Art Unit: 2622

direction one by one". This implies that the head position is determined at every line one by one similar to the limitation "adjacent two lines" as cited in the claim.

As per claim 5 (Original), Yoshiharu teaches the imaging device according to claim 1, Yoshiharu further teaches wherein said detection unit includes:

An acceleration sensor operable to detect acceleration from a movement of said imaging device; and a calculation unit **part 9** operable to calculate the horizontal shift amount based on the detected acceleration (paragraph 0027). *Yoshiharu teaches an angular velocity sensor that is similar to the angular speed sensor 18 and 19 in figure 4 of the instant application. In fact, in paragraph 0020 of instant specification it states "the horizontal shift amount can be detected easily using the existing acceleration speed sensor and the like". The specification does not differentiate between acceleration and speed sensors.*

As per claim 6 (Original), Yoshiharu teaches the imaging device according to claim 5, Yoshiharu further teaches wherein said acceleration sensor is operable to detect the acceleration for each horizontal cycle,

Said calculation unit is operable to calculate the horizontal shift amount in one horizontal cycle (paragraph 0030), and

wherein said horizontal compensation unit includes a read-out unit operable to read pixel signals, whose number is corresponding to the number of horizontal pixels,

Art Unit: 2622

out of said MOS image sensor starting from the head position determined by said determination unit (paragraphs 0024 and 0031-0042).

As per claim 7 (Currently Amended), Yoshiharu teaches the imaging device according to claim 1 Yoshiharu further teaches wherein said determination unit is operable to determine a head position of the line to be read out based on a head position of the line read out immediately before and the horizontal shift amount from the time of readout immediately before (paragraphs 0031-0038).

As per claim 11 (Original), Yoshiharu teaches the imaging device according to claim 1, Yoshiharu further teaches wherein said detection unit is further operable to detect a vertical shift amount of the image, and said imaging device further comprises a vertical compensation unit operable to compensate a distortion expanded and contracted in vertical direction of an image captured in an image unit, based on the detected vertical shift amount (paragraph 0017-0019).

As per claim 12 (Original), Yoshiharu teaches the imaging device according to claim 11, Yoshiharu further teaches wherein said vertical compensation unit includes:

a line buffer (**storage section 4**) operable to store pixel signals, whose number is corresponding to a plurality of lines read out of said MOS image sensor (paragraphs 0055-0061),

Art Unit: 2622

a determination unit operable to determine a compensation line position for each line, based on the vertical shift amount detected by said detection unit (paragraphs 0055-0061), and

a vertical interpolation unit operable to calculate pixel signals at the position of a compensation line by means of pixel interpolation between lines using pixel signals stored in said line buffer and pixel signals read out from said MOS image sensor (paragraphs 0059-0063).

As per claim 13 (Original), Yoshiharu teaches the imaging device according to claim 12 Yoshiharu further teaches wherein said vertical interpolation unit is operable to perform pixel interpolation using the pixel signals in two lines, that are the proximate two lines above and beneath the compensation line position determined by said determination unit (paragraphs 0059-0063).

As per claim 17 (Original) this claim is rejected because it recites the subject matters that were previously discussed in claim 1.

As per claim 18 (Original) this claim is rejected because it recites the subject matters that were previously discussed in claim 2.

As per claim 19 (Original) this claim is rejected because it recites the subject matters that were previously discussed in claim 3.

Art Unit: 2622

As per claim 20 (Original) this claim is rejected because it recites the subject matters that were previously discussed in claim 4.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshiharu as applied to claim 6 above, in view of Chapman, US Patent Application 2004/0036788.

As per claim 8, Yoshiharu teaches the imaging device according to claim 6, Yoshiharu further teaches the interpolation of pixels in the horizontal direction (paragraphs 0035-0036) and the interpolation of the pixel (picture element data) with the line nearest to the line position after the blurring correction (paragraph 0059) Yoshiharu does not explicitly disclose how to determine the head position in units of a subpixel and interpolate pixels to achieve subpixel as cited in the claim.

Art Unit: 2622

However, Chapman teaches the method of interpolation by calculating the neighboring pixels in order to recover the value of a defective subpixel in an image sensor (paragraph 0132).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to combine the interpolation method taught by Chapman with the interpolation of Yoshiharu so as to provide an image device with camera-shake detection that has higher degree of accuracy due to its subpixel interpolation.

Examiner's Note

The Examiner cites particular figures, paragraphs, columns and line numbers in the reference(s), as applied to the claims above. Although the particular citations are representative teachings and are applied to specific limitations within the claims, other passages, internally cited references, and figures may also apply. In preparing a response, it is respectfully requested that the Applicant fully consider the references, in their entirety, as potentially disclosing or teaching all or part of the claimed invention, as well as fully consider the context of the passage as taught by the reference(s) or as disclosed by the Examiner.

Conclusion

Art Unit: 2622

10. The prior arts made of record and not relied upon are considered pertinent to applicant's disclosure:

Schweid, Stuart A. et al. (US 20020097438 A1) System and apparatus for single subpixel elimination with local error compensation in an high addressable error diffusion process.

Elliott, Candice Hellen Brown et al. (US 20050088385 A1) System and method for performing image reconstruction and subpixel rendering to effect scaling for multi-mode display.

Sato; Kazuchika et al. (US 7042507 B2) Digital camera, pixel data read-out control apparatus and method, blur-detection apparatus and method.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang V. Le whose telephone number is (571) 270-5014. The examiner can normally be reached on Monday through Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor David Ometz can be reached on (571)272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2622

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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